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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/193,032	11/16/98	RENNEKE	R 30-4012

IM62/0905

ALLIEDSIGNAL
LAW DEPARTMENT- M/S 36-2-76000
2525 WEST 190TH STREET
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EXAMINER	
STRICKLAND,J	
ART UNIT	**PAPER NUMBER**
1754	8

DATE MAILED: 09/05/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/193,032	Renneke et al.
Examiner	**Group Art Unit**
Strickland, Jonas	1754

☒ Responsive to communication(s) filed on *Jun 19, 2000*

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *three* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *1, 3-11, and 13-20* is/are pending in the applicat

Of the above, claim(s) *18-20* is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 3-11, and 13-17* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicants amendment filed on 6/19/00 and entered as Paper No. 7. Claims 1-20 are pending. Claims 18-20 are withdrawn from consideration due to a restriction requirement. Claims 2 and 12 have been canceled by Applicant.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-5, 7-11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. (EP 0 625 368) in view of Zensuke (JP 07 000743).

Applicant claims a NO_x removal apparatus comprising a support made of a mixture including manganese dioxide and copper oxide; and an alkali material combined with the support; the support and the alkali material being combined for NO_x removal. Applicant further claims that the alkali material is potassium carbonate. The gas having a temperature below 100°C during the NO_x removal, this is deemed as failing to limit the apparatus structure.

Shimada et al discloses a process for cleaning a harmful gas at an ordinary temperature, which allows for excellent cleaning on the gas (p.3, lines 13-14). The cleaning agent used to remove the harmful gas is comprised of an alkali metal compound supported on a metallic oxide. The metallic oxide comprises cupric oxide (copper oxide) and manganese dioxide, which is prepared by impregnating an alkali material (claim 11; p. 3, lines 17-18 and lines 53-55). The composition is comprised of 40% by weight of cupric oxide and 60% weight of manganese dioxide. The reference also goes on to teach that it contains about 30% or less by weight of oxide of potassium or potassium carbonate (claims 14-16, p. 3, lines 37-41). The temperature of contact between the cleaning agent and the harmful gas is about 0 to 100°C, but it is usually room temperature 10 to 50°C (p. 3, lines 57-58). However, Shimada et al does not teach a mixture including a chromium oxide with respect to claim 13.

Zensuke teaches an adsorbent excellent in the adsorption of nitrogen oxide, particularly at low temperature by carrying copper, a metal oxide of manganese and chromium, and a carbonate. The component ratio of the carbonate to the alkali metal to the carrier is 5-30 weight %.

It would have been obvious based on the teachings of Zensuke to include chromium oxide into a mixture having manganese oxide and copper oxide and an alkali metal compound as taught by Shimada et al. Furthermore, the Zensuke reference teaches carrying this reaction at a low temperature. In reference to claims 1 and 3-10, Shimada et al does not disclose using the adsorbent for the removal of NO_x gases, but for the removal of harmful gases. Examiner holds that NO_x gases are harmful and the Zensuke et al reference teaches using an adsorbent comprised

of copper oxide, manganese dioxide, chromium oxide, and carbonate at low temperatures. Furthermore with respect to claims 8-10, the Shimada et al reference does not teach a first and second vessel and an enclosure for providing gas, but Shimada teaches an impregnation method used to mix the support particles and the alkali metal. Applicant recites within the specification p 4, lines 18-19 that the alkali metal may be combined with the support in many ways. It would have been obvious to use two separate vessels and an enclosure to combine the support particles and the alkali metal. Zensuke does not give a specific temperature range for the NO_x removal, but the Examiner holds that the reference discloses the desire for the removal of NO_x gases at low temperatures such as for temperatures below 100°C. In any case, the temperature does not limit the apparatus structure. Furthermore, the Examiner holds that the teachings of Shimada et al in view of Zensuke have the expectation of achieving exceptional results within the art based on their equivalence within the art.

4. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al (EP 0625368 A) in view of Zensuke (JP 07 000743) as applied to claims 1, 3-5, 7-11, and 13-16 above, and further in view of Ichiki et al (EP 0722763 A1).

Applicant claims, with respect to claims 6 and 17, the support particles have an internal surface area of at least 150 m^2/g.

The teachings of Shimada et al and Zensuke have been discussed above and they do not teach the surface area of the support area of at least 150 m^2/g.

Ichiki et al discloses NO_x adsorbents having copper and manganese oxides on a supported carrier for the adsorbing and removing of NO_x gases, wherein the specific surface area of the supported particles of the adsorbent is 40-200 m^2/g (p. 3, lines 22-27).

It would have been obvious to one of ordinary skill at the time of the invention based on the teachings of Ichiki et al to utilize an adsorbent having a specific surface area from 40-200 m^2/g for the adsorbing of NO_x gases. Ichiki et al teaches that an adsorbent having this physical property exhibits thermal resistance and a high adsorbing performance. Although Ichiki et al does not disclose having an alkali metal impregnated into the supported particles (copper and manganese oxides), Examiner holds that the supported particles having the disclosed surface area as taught by Ichiki et al may be impregnated with the alkali metal compounds as taught by Shimada et al. Furthermore, Examiner holds that the teachings of Ichiki et al, Shimada et al, and Zensuke would achieve exceptional results based upon their equivalence in the art of adsorbing harmful gases, such as NO_x gases.

Response to Arguments

5. Applicant's arguments filed on 6/19/00 have been fully considered but they are not persuasive.

Applicant argues that the weight percentages of the copper oxide and manganese oxide taught in the Shimada et al reference are different than the weight percentages of copper oxide and manganese oxide in amended claim 1. Applicant argues that the Shimada et al reference

support includes a copper oxide weight percentage of about 44 wt% to 83.3 wt%, whereas amended claim 1 recites a weight percentage not greater than 40 wt%. Applicant also argues that Shimada in view of Zensuke does not teach using a copper oxide and manganese dioxide for NOx removal.

Shimada teaches a process for removing harmful gases using a metal oxide-based composition comprised of cupric oxide (copper oxide) and manganese oxide. The composition is comprised of a 40% by weight of cupric oxide and 60% by weight of manganese oxide (p.3, line 28). Zensuke teaches using copper oxide, manganese oxide, chromium oxide and an alkali metal carbonate as an adsorbent to adsorb nitrogen oxide. Therefore, in view of the teachings of Zensuke, one having ordinary skill in the art would be motivated to modify Shimada by using a copper oxide, manganese oxide, and an alkali metal adsorbent. Such modification would be obvious, because one would expect that the use of a copper oxide, manganese oxide, and an alkali metal carbonate adsorbent to adsorb nitrogen oxides as taught by Zensuke would be similarly useful and applicable to the process of removing harmful gases using a copper oxide, manganese oxide, and an alkali metal carbonate adsorbent, wherein the copper oxide content is not greater than 40 wt% as taught by Shimada.

With respect to Applicants argument to the restriction requirement, which was made final in the last office action, Applicant has failed to show how the apparatus claimed can be used in another materially different process other than removing NOx gases. The restriction requirement is still deemed proper.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication from the examiner should be directed to Jonas N. Strickland at (703)306-5692. The examiner can normally be reached on Monday through Thursday and every other Friday from 8:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin, can be reached at (703)308-1164. The Group 1700 facsimile machine number is (703)305-3599.

J.N. Strickland

August 28, 2000

TOM DUNN
PRIMARY EXAMINER
A.U. 1754